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# ECOLOGY

Ecology (from Greek: οἶκος, "house", or "environment"; -λογία, "study of")[A] is the branch of biology[1] which studies the interactions among organisms and their environment. Objects of study include interactions of organisms with each other and with abiotic components of their environment. Topics of interest include the biodiversity, distribution, biomass, and populations of organisms, as well as cooperation and competition within and between species. Ecosystems are dynamically interacting systems of organisms, the communities they make up, and the non-living components of their environment. Ecosystem processes, such as immediate production, pedogenesis, nutrient cycling, and niche construction, regulate the flux of energy and matter through an environment. These processes are sustained by organisms with limited life history traits. Biodiversity means the varieties of breed, genes, and ecosystems, enhances certain ecosystem services.

# ENVIRONMENT

The biophysical environment is the living and abiotic surrounding of an organism or population, and consequently includes the factors that have an influence in their survival, development, and evolution.[1] The biophysical environment can vary in scale from microscopic to global in extent. It can also be subdivided according to its attributes. Examples include the marine environment, the atmospheric environment and the terrestrial environment.[2] The number of biophysical environments is countless, given that each living organism has its own environment.

# ECOSYSTEM

An ecosystem is a community made up of living organisms and nonliving components such as air, water and mineral soil, all interacting as a system.[2] (However, ecosystems can be defined in many ways.[3]) The biotic and abiotic components interact through nutrient cycles and energy flows.[4] Ecosystems are the network of interactions among organisms, and between organisms and their environment.[5] Ecosystems can be of any size but one ecosystem has a specific, limited space.[6] On a larger scale, some scientists view the entire planet as one ecosystem).[7]

## ENERGY

Energy, water, nitrogen and soil minerals are other essential abiotic components of an ecosystem. The energy that flows through ecosystems comes primarily from the sun, through photosynthesis. Photosynthesis also captures carbon dioxide from the atmosphere. Animals also play an important role in the movement of matter and energy through ecoystems. They influence the amount plant and microbial biomass that lives in the system. As organic matter dies, decomposers release carbon back to the atmosphere. This process also facilitates nutrient cycling by converting nutrients stored in dead biomass back to a form that can be used again by plants and other microbes.[8]

## CLASS SCHEDULE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LESSON | TOPIC | ASSIGNMENT | POINTS | DUE |
| 1 | What is distance learning? | WIKI #1 | 10 | MARCH 10 |
| presentation | 20 |
| 2 | History & theories | Brief Paper | 20 | March 24 |
| Spring Break | | | | |
| 3 | Distance Learners | Discussion #1 | 10 | April 7 |
| Group Project | 50 | April 14 |
| 4 | Media Selection | Blog #1 |  | April 21 |

# GENETICS

Genetics is the study of genes, genetic variation, and heredity in living organisms.[1][2] It is generally considered a field of biology, but intersects frequently with many other life sciences and is strongly linked with the study of information systems.

The father of genetics is Gregor Mendel, a late 19th-century scientist and Augustinian friar. Mendel studied "trait inheritance", patterns in the way traits are handed down from parents to offspring. He observed that organisms (pea plants) inherit traits by way of discrete "units of inheritance". This term, still used today, is a somewhat ambiguous definition of what is referred to as a gene.

Trait inheritance and molecular inheritance mechanisms of genes are still primary principles of genetics in the 21st century, but modern genetics has expanded beyond inheritance to studying the function and behavior of genes. Gene structure and function, variation, and distribution are studied within the context of the cell, the organism (e.g. dominance), and within the context of a population. Genetics has given rise to a number of subfields, including epigenetics and population genetics. Organisms studied within the broad field span the domains of life (archaea, bacteria, and eukarya).

Genetic processes work in combination with an organism's environment and experiences to influence development and behavior, often referred to as nature versus nurture. The intracellular or extracellular environment of a cell or organism may switch gene transcription on or off. A classic example is two seeds of genetically identical corn, one placed in a temperate climate and one in an arid climate. While the average height of the two corn stalks may be genetically determined to be equal, the one in the arid climate only grows to half the height of the one in the temperate climate due to lack of water and nutrients in its environment.

# ETHOLOGY

Ethology is the scientific and objective study of animal behaviour, usually with a focus on behaviour under natural conditions, and viewing behaviour as an evolutionarily adaptive trait.[1] Behaviourism is a term that also describes the scientific and objective study of animal behaviour, usually referring to measured responses to stimuli or trained behavioural responses in a laboratory context, without a particular emphasis on evolutionary adaptivity.[2] Many naturalists have studied aspects of animal behaviour throughout history. Ethology has its scientific roots in the work of Charles Darwin and of American and German ornithologists of the late 19th and early 20th century, including Charles O. Whitman, Oskar Heinroth, and Wallace Craig. The modern discipline of ethology is generally considered to have begun during the 1930s with the work of Dutch biologist Nikolaas Tinbergen and by Austrian biologists Konrad Lorenz and Karl von Frisch, joint awardees of the 1973 Nobel Prize in Physiology or Medicine.[3] Ethology is a combination of laboratory and field science, with a strong relation to some other disciplines such as neuroanatomy, ecology, and evolutionary biology. Ethologists are typically interested in a behavioural process rather than in a particular animal group, and often study one type of behaviour, such as aggression, in a number of unrelated animals.

Ethology is a rapidly growing field. Since the dawn of the 21st century, many aspects of animal communication, emotions, culture, learning and sexuality that the scientific community long thought it understood have been re-examined, and new conclusions reached. New fields, such as neuroethology, have developed.

Understanding ethology or animal behaviour can be important in animal training. Considering the natural behaviours of different species or breeds enables the trainer to select the individuals best suited to perform the required task. It also enables the trainer to encourage the performance of naturally occurring behaviours and also the discontinuance of undesirable behaviours.[4]

# Η ΟΙΚΟΓΕΝΕΙΑ ΜΟΥ